USDA AGRICULTURAL RESEARCH
~~PESTICIDE EXPERIMENTAL~~ LABORATORY
3706 WEST NOB HILL BOULEVARD
YAKIMA, WASHINGTON

The Situation:

Wastes from the pesticide storage/formulation/mixing facility are disposed into an on-site septic tank drainfield. As a result, the pesticides have permeated the soil and may have contaminated groundwater.

The site is approximately three miles from backup sources for the Yakima drinking water supply. Irrigation is now the primary use of downstream surface and ground water supplies. Chemicals in this water would be taken up by crops.

Work Done To Date:

No action has been taken on this site so far.

What's Next?:

Drinking water/groundwater sampling.

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Facility Name: USDA AGRICULTURAL RESEARCH ~~Pesticide Experimental~~ Laboratory

Location: Yakima, Washington

EPA Region: 10

Person(s) in Charge of the Facility: Dr. Arthur Burditt

Name of Reviewer: H. Aldis Date: 7/30/82

General Description of the Facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

Agricultural experimental station handling small quantities of all sorts of pesticides and disposing of them by flushing into a septic tank drain field.

Scores: $S_M = $ ~~28.55~~ 27.82 ($S_{gw} = 48.12$ $S_{sw} = $ ~~11.16~~ 0 $S_a = $ -0-)

$S_{FE} = $ -0-

$S_{DC} = $ -0-

Figure 1

HRS COVER SHEET

Ground Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)		Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0)	45	1		45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.						
2 Route Characteristics						3.2
Depth to Aquifer of Concern	0 1 2 (3)		2	6	6	
Net Precipitation	0 (1) 2 3		1	1	3	
Permeability of the Unsaturated Zone	0 (1) 2 3		1	1	3	
Physical State	0 1 2 (3)		1	3	3	
Total Route Characteristics Score				11	15	
3 Containment	0 1 2 (3)		1	3	3	3.3
4 Waste Characteristics						3.4
Toxicity/Persistence	0 3 6 9 12 15 (18)		1	18	18	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8		1	1	8	
Total Waste Characteristics Score				19	26	
5 Targets						3.5
Ground Water Use	0 1 2 (3)		3	9	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 12 16 18 20 24 30 32 (35) 40		1	35	40	
Total Targets Score				44	49	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				27588	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 48.12			

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1		45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	(0) 1 2 3	1	0	3	
1-yr. 24-hr. Rainfall	(0) 1 2 3	1	0	3	
Distance to Nearest Surface Water	(0) 1 ~~(2)~~ 3	2	~~0~~ 0	6	
Physical State	0 1 2 (3)	1	3	3	
Total Route Characteristics Score			~~X~~	15	3
3 Containment	(0) 1 2 3	1	~~0~~ 3	3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8	
Total Waste Characteristics Score			19	26	
5 Targets					4.5
Surface Water Use	0 1 (2) 3	3	6	9	
Distance to a Sensitive Environment	(0) 1 2 3	2	0	6	
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 (12) 16 18 20 24 30 32 35 40	1	12	40	
Total Targets Score			18	55	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			7182	64,350	
7 Divide line 6 by 64,350 and multiply by 100		S_{sw} = ~~7182~~ 0			

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
[1] Observed Release	(0) 45	1		45	5.1
Date and Location:					
Sampling Protocol:					
If line [1] is 0, the S_a = 0. Enter on line [5]. If line [1] is 45, then proceed to line [2].					
[2] Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
[3] Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
[4] Multiply [1] x [2] x [3]				35,100	
[5] Divide line [4] by 35,100 and multiply by 100		S_a = 0			

FIGURE 9
AIR ROUTE WORK SHEET

	S	S^2
Groundwater Route Score (S_{gw})	48.12	2315.53
Surface Water Route Score (S_{sw})	0 ~~0.18~~	0 ~~124.55~~
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		2315.53 ~~2440.08~~
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		48.12 ~~49.40~~
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} \div 1.73 = S_M =$		27.82 ~~28.56~~

FIGURE 10
WORKSHEET FOR COMPUTING S_M

Fire and Explosion Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Total Targets Score				24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 4 by 1,440 and multiply by 100		S_{FE} = C			

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Incident	(0) 45	1		45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	(0) 1 2 3	1		3	8.2
3 Containment	0 15	1		15	8.3
4 Waste Characteristics Toxicity	0 1 2 3	5		15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 1 2 3 4 5	4		20	
Distance to a Critical Habitat	0 1 2 3	4		12	
Total Targets Score				32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				21,600	
7 Divide line 6 by 21,600 and multiply by 100	S_{DC} = 0				

FIGURE 12
DIRECT CONTACT WORK SHEET

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

None

Rationale for attributing the contaminants to the facility:

None

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2 ROUTE CHARACTERISTICS

<u>Depth to Aquifer of Concern</u>

Name/description of aquifers(s) of concern:

~~Sand and gravel water table aquifer~~ CEMENTED BASALT GRAVEL AQUIFER AND ELLENSBURG FORMATION AQUIFER (ASSUMED TO BE IN HYDRAULIC CONTINUITY DUE TO CHEMICAL SIMILARITY AND STRATIGRAPHIC CONTINUITY. FOXWORTHY, B.L., USGS WATER SUPPLY PAPER 1598, P. 60-61)

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

~~[illegible]~~
CEMENTED BASALT GRAVEL AQUIFER; 20-25 FT.

Depth from the ground surface to the lowest point of waste disposal/ storage:

~~[illegible]~~ EXACT DEPTH UNKNOWN - ASSUME 6 FT. PER SUPPLEMENTAL INSTRUCTIONS TO THE HRS 6/28/82.

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):
Oct/Mar ≈ 6.8" 3.6" of precip in Yakima falls as snow (36" of snow)

Mean annual lake or seasonal evaporation (list months for seasonal):
Oct/Mar evaporation low: Note average monthly temps and relative humidity.

Oct	Nov	Dec	Jan	Feb	Mar	
60°	≈45°	35-40°	25-30°	35°	50°	Temp.
65%	70%	85%	90%	80%	70%	Relative Humidity

Net precipitation (subtract the above figures):

Net infiltration probably 4-5" per year during winter months (Bill Weller, SCS, Hydrologist, Spokane)

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Sandy gravelly loam (well logs DOE files)

Permeability associated with soil type:

High

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

Liquids (CONVERSATION ON 8/24/82 WITH DR Eric Halfhill, ~~[illegible]~~. DEPUTY DIRECTOR USDA LABORATORY (509) 575-5982 ' AND ON 6/24/82 WITH BROOKS BROWN, ADMINISTRATIVE *** OFFICER (509) 575-5877)

3 CONTAINMENT

Containment   None – NO MEASURE(S) HAVE BEEN USED TO MINIMIZE A CONTAMINANT FROM ENTERING GROUND WATER: NO LINER IN PLACE QUIFIES SITE FOR A SCORE OF "3" UNDER THE LANDFILL METHOD.

Method(s) of waste or leachate containment evaluated:

Disposal to septic tank drain field

Method with highest score:

As above   LANDFILL – NO LINER

SCORE = "3"

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

~~Chlorinated pesticides (DDT etc)~~

LINDANE
TOXAPHENE
2,4-D
METHOXYCHLOR
SILVEX

Compound with highest score:

~~DDT~~   LINDANE

(CONVERSATION 4/21/83 BETWEEN H. ALDIS AND DR. ERIC HALFHILL DEPUTY DIRECTOR, USDA LABORATORY (509) 575-5982. DR. HALFHILL STATED THAT ALL THE ABOVE COMPOUNDS WERE AT SOME TIME DISPOSED TO THE SEPTIC TANK DRAIN FIELD)

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum).

~~[illegible]~~

A VALUE GREATER THAN "0"

Basis of estimating and/or computing waste quantity:

~~H. Aldis Phone conversation with Dr. Eric Halfhill [illegible] (509) 575-5982~~

LETTER FROM DR. ERIC HALFHILL, DEPUTY DIRECTOR, USDA LABORATORY TO BURT BOWEN, WASHINGTON STATE DEPT. OF ECOLOGY DATED 8/21/81 STATES

* * *

THAT < 250 GALLONS MIXED PESTICIDES CONTAINING < 100 lbs OF PESTICIDES AND APPROXIMATELY 5000 GALLONS RINSATE ARE DISPOSED TO THE SEPTIC TANK SYSTEM EACH YEAR. BASED UPON THIS THIS ADMISSION, THE MINIMUM VALUE FOR HAZARDOUS WASTE QUANTITY IS APPLICABLE.

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Drinking water DOE files - Water rights, public water supplies

~~Irrigation~~ ~~DOE files - water rights~~

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

Robert Barry well Logan Ave. SW¼ of SE¼ Sec 27 T13N R 18E W.M.
City of Yakima Airport well Sec 35 7500ft from site (DOE files)

Distance to above well or building:

About 2000ft for Barry well.

(YAKIMA WEST QUAD, 1:2400 SERIES, 1958, PHOTOREVISED 1974)

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

> 50,000 (City of Yakima)

~~[illegible]~~

CITY OF YAKIMA AIRPORT WELL IS A BACKUP WELL SERVING THE CITY OF YAKIMA WHICH HAS A POPULATION OF > 50,000 PEOPLE

(RITA GERMUSSON, ENGINEERING DEPT., CITY OF YAKIMA (509) 575-6120)

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

~~<200 acres (DOE water rights)~~

Total population served by ground water within a 3-mile radius:

>50,000

SURFACE WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

None

Rationale for attributing the contaminants to the facility:

None

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2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

< 3% (U.S.G.S. Yakima West Quad. map 1974)

Name/description of nearest downslope surface water:

Wide Hollow Creek

Average slope of terrain between facility and above-cited surface water body in percent:

< 3%

Is the facility located either totally or partially in surface water?

No.

Is the facility completely surrounded by areas of higher elevation?

No

1-Year 24-Hour Rainfall in Inches

0.9" 38% of 2yr-24Hr Rainfall (NOAA Atlas 2).

Distance to Nearest Downslope Surface Water

~~[illegible]~~ NOT APPLICABLE — BASED UPON THE NATURE OF THE CONSTRUCTION OF THE DRAIN FIELD, IT IS UNLIKELY THAT SURFACE RUNOFF WOULD OCCUR TO ~~[illegible]~~ FLOW OVERLAND INTO SURFACE WATER

Physical State of Waste

Liquid (Dr Eric Halfhill, U.S.DA. Yakima).

* * *

3 CONTAINMENT

Containment ~~[illegible]~~

Method(s) of waste or leachate containment evaluated:

~~[illegible]~~

LANDFILL

Method with highest score:

~~[illegible]~~ LANDFILL HAS ADEQUATE COVER MATERIAL

SCORE = "0"

4 WASTE CHARACTERISTICS

SEE GROUNDWATER SECTION

Toxicity and Persistence

Compound(s) evaluated

[redacted]

Compound with highest score:

[redacted]

Hazardous Waste Quantity

SEE GROUNDWATER SECTION

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

[redacted]

Basis of estimating and/or computing waste quantity:

[redacted]

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5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Irrigation
RECREATION (BANK FISHING)
(WASHINGTON DEPT. OF ECOLOGY, YAKIMA, WA - WATER RIGHTS FILES)

Is there tidal influence?

NO

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

NONE

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

NONE

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

None

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

None for drinking water.

IRRIGATION (DOE WATER RIGHTS FILES, YAKIMA, WA.)

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

480 acres S4 00699A Water right NE¼ of SE¼ Section 35
18 acres S4 00511A " SE¼ SW¼ SE¼ Sec 36

Total population served:

~~[illegible] people~~ 498 ACRES × $\frac{1.5 \text{ PEOPLE}}{\text{ACRE}}$ = 747 PEOPLE

Name/description of nearest of above water bodies:

Wide Hollow Creek.

Distance to above-cited intakes, measured in stream miles.

~~[illegible]~~ 1950 FT. MEASUREMENT FROM (YAKIMA WEST QUAD, 1974)

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

None

Date and location of detection of contaminants

Methods used to detect the contaminants:

Rationale for attributing the contaminants to the site:

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2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Most incompatible pair of compounds:

Toxicity

Most toxic compound:

Hazardous Waste Quantity

Total quantity of hazardous waste:

Basis of estimating and/or computing waste quantity:

* * *

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi 0 to 1 mi 0 to 1/2 mi 0 to 1/4 mi

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

Distance to critical habitat of an endangered species, if 1 mile or less:

Land Use

Distance to commercial/industrial area, if 1 mile or less:

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Distance to residential area, if 2 miles or less:

Distance to agricultural land in production within past 5 years, if 1 mile or less:

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?